June 2, 1999

LICENSEE: Duke Energy Corporation (Duke)

FACILITY: Oconee Nuclear Station, Units 1, 2, and 3

SUBJECT: SUMMARY OF MAY 27, 1999, PHONE CALLS BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION (NRC) STAFF AND DUKE REPRESENTATIVES TO DISCUSS THE OCONEE LICENSE RENEWAL APPLICATION

On May 27, 1999, and June 2, 1999, representatives of Duke had a phone call with the NRC staff in Rockville, Maryland, to discuss the Oconee license renewal application. The purpose of the phone call was to discuss questions that the staff had regarding the application. The Enclosure contains the staff's questions. For the May 27, 1999, phone call, the Duke participants were Greg Robison, Mike Semmler, and Debbie Ramsey. The staff participants were Stephanie Coffin, Chris Gratton, Jin Guo and Joe Sebrosky. There were actually two separate phone calls on June 2, 1999. For the first call on June 2, 1999, the Duke participants were Bob Gill, and Debbie Ramsey. For the second call the Duke participants were Bob Gill and Greg Robison. The staff participants were Chris Gratton and Joe Sebrosky for both calls on June 2, 1999.

For the May 27, 1999, phone call, Duke provided verbal answers to the questions in the Enclosure (with the exception of item number 8). The staff stated that the verbal responses that Duke provided addressed the staff's issues. Duke also stated that the answer to Question 8 would not be difficult, and it would provide a written response to all the staff's questions through an E-mail. The responses that Duke provided through the E-mail are contained in the Enclosure. Similar phone calls were held on June 2, 1999, to discuss items 14 and 15 of the Enclosure. There were two phone calls on June 2, 1999, to make sure that the staff understood Duke's response to items 14 and 15. The Enclosure reflects the staff's final understanding for these issues. The staff stated that if they needed a formal letter from Duke for any of the responses it would be documented in the safety evaluation report (SER) for the Oconee license renewal application as a Confirmatory Item. In addition, if any additional information is required for any of the issues, the information will be identified in the SER as an Open Item. A draft of this summary was provided to Duke to allow them the opportunity to comment on the summary prior to issuance.

Original Signed By

Joseph M. Sebrosky, Project Manager
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

070018

Docket Nos. 50-269, 50-270, and 50-287

Enclosure: Discussion Items

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Discussion Items

1. The reactor building spray system inspection does not mention the nitrogen purge and blanketing system, yet the applicant takes credit for this aging management program in Section 3.5.4 of the LRA. The staff requests that the applicant discuss how the inspection of the reactor building spray system manages aging effects for the nitrogen purge and blanketing system.

**Duke Response:** The Reactor Building Spray System Inspection will perform an examination of stainless steel components subject to alternate wetting and drying with borated water that could lead to cracking or loss of material. The inspection is to determine if cracking or loss of material is occurring due to alternate wetting and drying. Some stainless steel components in the Nitrogen Purge and Blanket System are also exposed to alternate wetting and drying with borated water that could lead to cracking or loss of material. Since the materials and environments are the same, inspection in both systems was determined not to be necessary. The results of the Reactor Building Spray System Inspection will be applied to the components in the Nitrogen Purge and Blanket System exposed to alternate wetting and drying.

The results of the Reactor Building Spray System Inspection bound the components of the Nitrogen Purge and Blanket System. As noted earlier, both systems have stainless steel components alternately wetted and dried with borated water. Where the susceptible components are located in the Reactor Building Spray System, they are exposed to an oxygenated environment in combination with borated water. The Nitrogen Purge and Blanket System components are expose to nitrogen gas in combination with borated water. Since the oxygenated environment is more corrosive than nitrogen gas, the inspection of the Reactor Building Spray System components is more likely to identify the existence of these applicable aging effects. As a result, the inspection of the Reactor Building Spray System components would bound the inspection of the Nitrogen Purge and Blanket System components.

2. The applicant stated that the frequency of system performance testing activities (Section 4.27 of the LRA) varies by system—ranging from quarterly to every third refueling outage. The auxiliary service water system is visually inspected every 5 years. The turbine generator cooling water system is tested every time the Keowee station operates, which is about 10 percent of the time. The staff requests the applicant present operating experience that demonstrates these frequencies can be relied upon to detect aging effects before there is a loss of component intended function.

**Duke Response:** All of the system performance testing activities have been performed for at least ten years, with some of the testing activities having been performed since initial operation of Oconee, the Standby Shutdown Facility, and Keowee. Many of these testing activities were credited in response to Generic Letter 89-13. As with other programs, any indication of the applicable aging effects identified during the system performance testing activities will initiate the Problem Investigation Process. Performance testing has proven an effective method of managing fouling in service water systems. A decreasing trend in flow rates has resulted in piping replacements in several locations, including portions of small diameter piping in the Low Pressure Service Water System and larger bore piping in the SSF Auxiliary Service Water System.

3. In Section 4.3.10 of the LRA, Duke described the RCP motor oil collection system inspection. The RCP motor oil collection system inspection will characterize loss of material from corrosion of the carbon steel, brass, and stainless steel components in the RCP motor oil collection system that may periodically be exposed to water from contamination of the oil. The staff identified that copper is another component in the RCP motor oil collection system and requested that the applicant confirm that copper components are included within the scope of this program.

**Duke Response:** Copper components are included in the Reactor Coolant Pump Motor Oil Collection System Inspection. Copper was inadvertently omitted from Section 4.3.10.

4. The Keowee oil sampling program takes oil samples every 6 months for analyses. The staff requests the applicant present operating experience that demonstrates this frequency can be relied upon to detect aging effects before there is a loss of component intended function.

**Duke Response:** As noted in Section 4.3.5 of the Application, the Keowee Oil Sampling Program is considered a new program since it was recently formalized. New programs do not have operating experience to judge their effectiveness.

5. For the Keowee oil sampling program, the applicant implements corrective actions if the oil samples contain greater than 0.1 percent water by volume. The staff requests that the applicant identify the basis for this value.

**Duke Response:** Duke hydro operating experience established 0.1 percent water by volume as the corrective action limit. By comparison, EPRI document NP-4916, Lubrication Guide, Revision 2 which documents the latest industry guidance in this area recommends a limit of 0.2 percent water by volume. Duke continues to use the more conservative limit of 0.1 percent water by volume and credits it as the corrective action limit.

6. The applicant stated in its May 10, 1999 response to RAI 4.25-4 that the recirculating cooling water heat exchangers and screens of the condenser circulating water system do not perform a pressure boundary function. Please confirm then that Table 2.5-9 is incorrect when its states that these two components do perform a pressure boundary function.

**Duke Response:** Table 2.5-9 should not have listed the intended function of pressure boundary for the screens and the recirculating cooling water heat exchangers.

7. The applicant stated in its May 10, 1999 response to RAI 4.25-4 that there is no tubing in the Condenser Circulating Water System. The staff agrees. The original question related to tubing in the <u>High Pressure Service Water System</u>. Please confirm that the tubing in the High Pressure Service Water System does not support any system intended function; i.e., confirm then that Table 2.5-9 is incorrect when it states that tubing in this system perform a pressure boundary function.

**Duke Response:** The tubing in the High Pressure Service Water System does not support any system intended function. As a result, Table 2.5-9 is incorrect in stating tubing performs a pressure boundary function.

**8.** Regarding Duke's February 8, 1999, response to RAI 2.7-5(a), the staff agrees with the applicant's categorization of the anchorage systems of the field-erected vertical tanks as steel equipment component supports (as stated on page 2.7-5 of the application). However, at some plants there are vertical tanks that have tank foundations that are made of concrete rather than steel (e.g., BWST). Are these tank foundation considered to be within the scope of license renewal? If so, please indicate where they are addressed in the license renewal application.

**Duke Response:** Vertical tanks such as the Borated Water Storage Tank (BWST) are included in mechanical scope. The tanks' foundations or pads are included in Oconee license renewal scope in Section 2.7.2.1. The BWST foundation is located in the Yard and included within the category of equipment pads in Table 2.7-8.

The BWST pad is identified in the license renewal basis document (OSS-0274.00-00-0007) that was reviewed onsite by the NRC during the scoping and screening inspection.

**9.** The staff has reviewed Duke's May 10, 1999, response to Question 2.7-11. The staff still has a concern regarding the major structural components that comprise the spent fuel pool. Please provide a simplified sketch of the spent fuel pool that shows the major structural components.

**Duke Response:** As described in Section 9.1.2 of the Oconee UFSAR, the spent fuel pool is constructed of reinforced concrete lined with stainless steel plate. The fuel pool concrete and reinforcing are included in the aging management review for the Auxiliary Building concrete. The liner plate (including its welds) is identified in Table 2.7-1 of Exhibit A of the Application.

**10.** Section 2.7.6.4 of the license renewal application addressed the function of the electrical switchgear bay but did not describe its structure and whether its structural components are subject to an aging management review. Please provide a description, or simplified drawings, of the structural components that comprise the electrical switchgear bay.

**Duke Response:** The switchgear bay is part of and located on the operating floor level of the Keowee Powerhouse. The operating floor of the Powerhouse is divided into two areas or locations. The equipment or erection bay is the area over the generators. The switchgear bay is the adjacent area where the switchgears are located. As part of the Powerhouse, this area (switchgear bay) is subject to an aging management review.

**11.** The description in the LRA of the intake structure's configuration and components is still unclear. Based on the information provided in the LRA and the responses to the staff's RAIs, the staff cannot determine whether the applicant has properly identified the components subject to an aging management review. Components, such as steel beams, columns, and trusses are typically associated with steel superstructures. Since the intake structure at Oconee has no superstructure, these components should not be listed on Table 2.7-4. For the staff to complete its review of the components subject to aging management review, the applicant is requested to review the description of the intake structure in the application and the UFSAR and provide a revised list of components that are subject to an aging management review. To be consistent with the information already contained in the application, any components added to Table 2.7-4 should include intended functions.

**Duke Response:** The Intake Structure has no steel superstructure. For the purposes of Table 2.7-3, miscellaneous steel components were included under the commodity group "steel beams, columns, plates, and trusses." The components within the Intake Structure that fall within that commodity group are miscellaneous steel plates and other steel sections for guides for the trash racks and screens.

**12.** In Table 2.7-7, the applicant lists the components subject to an AMR for the turbine building. Roof slabs are listed under the concrete components. In most cases, buildings with steel frame superstructures like the turbine building use a composite roofing system. In addition, the turbine building roof at ONS has a special feature described in Section 2.7.10.6 of the LRA. In Section 2.7.10.6, the applicant describes shield wire pull-off structures located on the roof of the turbine building which provide support to the transmission lines from the 230 kV switchyard to the plant. However, it is not clear whether these components are included on Table 2.7-7. Please describe the construction of the roof structure for the turbine building and identify the roof structure components that are subject to AMR. In addition, list the components (and identify the intended functions) associated with the shield wire pull-off structures and identify which of these structures are subject to an AMR, or identify where in the application these structures are evaluated, or provide a justification why these structures are not subject to an aging management review.

**Duke Response:** As noted in Section 2.7.9 of Exhibit A of the Application, the Turbine Building includes the Switchgear Enclosures that are located adjacent to the Turbine Building. The Switchgear Enclosures are reinforced concrete structures with reinforced concrete roof slabs. The concrete roof slabs are included in Table 2.7-7. The Turbine Building has a built-up roofing system. The built-up roofing system is comprised of a metal roof deck, covered with rigid insulation, bitumen, inorganic felts and a cover layer of aggregate. The composite roofing system is not listed within Table 2.7-7 because the roofing system is not subject to an aging management review. The roofing system is a short-lived component and replacement of the roofing system is based on performance or condition. Replacement based on condition is discussed in Section III.f.(i)(b) of the Statement of Consideration (SOC) of 10 CFR Part 54.

The shield wire pull-off structures are included with the Yard Structures in Section 2.7.10.6 of Exhibit A of the Application. The shield wire pull-off structures are A-frame towers similar to the strain structures in the 230 kV switchyard. The structures are constructed of hot-dipped galvanized steel with welded and bolted connections. The shield wire pull-off structures are included in the aging management review for Yard Structures under Transmission Towers. The shield wire pull-off structures are included with Transmission Tower commodity group because of their similar materials of construction and function. The Transmission Towers are listed in Tables 2.7-8 and 3.7-8 of Exhibit A of the Application. The shield wire pull-off structures are subject to an aging management review. The applicable aging effect and aging management program are identified in Table 3.7-8 of the Application within the commodity group "Transmission Towers."

**13.** In Duke's response to RAI 3.7.6-3, it states that the Keowee roof structure is comprised of a built-up roofing system and not a roof slab. This appears to be inconsistent with Table 2.7-4. Please describe the construction of the roof structure for the Keowee structure and identify the roof structure components that are subject to an AMR.

**Duke Response:** Keowee structures use both reinforced concrete roof slabs and built-up (or composite) roofing systems. The Keowee Breaker Vault that is located within the Powerhouse has a reinforced concrete roof slab (see Section 2.7.6.1 of Exhibit A of the Application). The main structures such as the Keowee Powerhouse and the Service Bay Structure have a built-up (or composite) roofing system. The system is comprised of a metal roof deck, covered with rigid insulation and a rubberized material. The roofing system is not included in Table 2.7-4 because the roofing system is not subject to an aging management review. The roofing system is a short-lived component and replacement of the roofing system is based on condition. Replacement based on condition is discussed in Section III.f.(i)(b) of the Statement of Consideration (SOC) of 10 CFR Part 54.

**14.** Although the applicant states that the piping and anchors that support SR/NSR boundaries for Oconee piping classes B, C, and F are within the scope of license renewal and subject to AMR, it does not specify which ones they are. They state: " All fluid system containing piping classified as Oconee Class B, C, or F have the potential for SR/NSR boundaries with seismic boundaries extending beyond them." The rule requires that the applicant identify and list the structures and components subject to AMR. It is not clear which piping segments and anchors providing support to SR boundaries are within the scope of license renewal and subject to AMR.

**15.** Because of the way the answer to 2.7-6 is written, it is not clear why Class A and D piping are not included in the list of piping classes with SR/NSR boundaries. The applicant should provide a justification why class A and D piping do not have piping segments and anchors that provide support to SR/NSR boundary valves.

**Duke Response to Items 14 and 15:**The response to RAI 2.7-6 should be revised to read as follows:

For Oconee, the portions of piping between the boundary of the safety-related piping (e.g., valve, orifice) and nonsafety-related piping and the first seismic anchors (or equivalent) beyond the boundary are within the scope of license renewal and subject to an aging management review. These piping segments beyond the safety-related/nonsafety-related boundaries perform the intended function of providing structural integrity under all current licensing basis design loading conditions for safety-related components within the scope of license renewal. For Oconee Class B, C, and F, all piping between the boundary of the safety-related piping and nonsafety-related piping and the first seismic anchors (or equivalent) beyond the boundary are within the scope of license renewal and subject to an aging management review. Class A and D piping systems do not have these safety/nonsafety interfaces. Class A piping connects to either Class B or C piping, which is safety-related. Class D piping is nonsafety piping which is qualified for seismic or II/I issues.

The applicable aging effects for the piping segments beyond the safety-related/nonsafety-related boundary are the same as those in their respective fluid systems. The aging management programs credited in these systems for managing the applicable aging effects also apply to the piping segments between the safety-related/nonsafety-related boundary up to the first seismic anchors (or equivalent) beyond the boundary.

The seismic anchors (or equivalent) supporting these piping segments beyond the safety-related/nonsafety-related boundary are within the scope of license renewal as noted in Section 2.7.2.2.1 of the Application. The aging management review for these seismic anchors (or equivalent) is presented in Section 3.7 of the Application.

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